1. Find the inverse of the function below. Then, evaluate the inverse at $x = 8$ and choose the interval that $f^-1(8)$ belongs to.

$$f(x) = \ln(x+5) + 2$$

A. $f^{-1}(8) \in [22020.47, 22024.47]$

B. $f^{-1}(8) \in [21.09, 27.09]$

C. $f^{-1}(8) \in [442414.39, 442420.39]$

D. $f^{-1}(8) \in [405.43, 413.43]$

E. $f^{-1}(8) \in [388.43, 399.43]$

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2. Add the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = \sqrt{6x-28} \text{ and } g(x) = x+6$$

A. The domain is all Real numbers except $x = a$, where $a \in [1.17, 5.17]$

B. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [0.67, 5.67]$

C. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-5.5, -0.5]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-1.67, 4.33]$ and $b \in [-4.2, -3.2]$

E. The domain is all Real numbers.

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3. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = -15$ and choose the interval that $f^-1(-15)$ belongs to.

$$f(x) = \sqrt[3]{3x+4}$$

A. $f^{-1}(-15) \in [1125.5, 1129.3]$

B. $f^{-1}(-15) \in [1122.7, 1126]$

C. $f^{-1}(-15) \in [-1125.4, -1122.4]$

D. $f^{-1}(-15) \in [-1129, -1126.3]$

E. The function is not invertible for all Real numbers.

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4. Determine whether the function below is 1-1.

$$f(x) = 9x^2 - 39x - 230$$

A. No, because the domain of the function is not $(-\infty, \infty)$.

B. No, because there is a y-value that goes to 2 different x-values.

C. Yes, the function is 1-1.

D. No, because the range of the function is not $(-\infty, \infty)$.

E. No, because there is an x-value that goes to 2 different y-values.

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5. Multiply the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = \frac{3}{3x - 16} \text{ and } g(x) = \frac{2}{3x + 16}$$

A. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-6.6, 5.4]$

B. The domain is all Real numbers except $x = a$, where $a \in [-8.25, -4.25]$

C. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [5, 13]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [0.33, 6.33]$ and $b \in [-11.33, -1.33]$

E. The domain is all Real numbers.

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6. Find the inverse of the function below. Then, evaluate the inverse at $x = 4$ and choose the interval that $f^{-}1(4)$ belongs to.

$$f(x) = e^{x+2} + 2$$

A. $f^{-1}(4) \in [-0.7, 2.7]$

B. $f^{-1}(4) \in [-3.5, -0.7]$

C. $f^{-1}(4) \in [-0.7, 2.7]$

D. $f^{-1}(4) \in [2.8, 5.5]$

E. $f^{-1}(4) \in [2.8, 5.5]$

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7. Choose the interval below that f composed with g at $x = -1$ is in.

$$f(x) = -4x^3 - 2x^2 + 4x - 1 \text{ and } g(x) = -2x^3 - 2x^2 - x$$

A. $(f \circ g)(-1) \in [42, 47]$

B. $(f \circ g)(-1) \in [38, 40]$

C. $(f \circ g)(-1) \in [4, 6]$

D. $(f \circ g)(-1) \in [-12, 0]$

E. It is not possible to compose the two functions.

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8. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = 13$ and choose the interval that $f^-1(13)$ belongs to.

$$f(x) = \sqrt[3]{5x + 3}$$

A. $f^{-1}(13) \in [438.67, 438.81]$

B. $f^{-1}(13) \in [439.45, 441.34]$

C. $f^{-1}(13) \in [-439.21, -438.65]$

D. $f^{-1}(13) \in [-440.29, -439.8]$

E. The function is not invertible for all Real numbers.

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9. Choose the interval below that f composed with g at $x = -1$ is in.

$$f(x) = -2x^3 + 3x^2 + 4x \text{ and } g(x) = 3x^3 - 1x^2 - 2x$$

A. $(f \circ g)(-1) \in [24, 37]$

B. $(f \circ g)(-1) \in [20, 21]$

C. $(f \circ g)(-1) \in [1, 14]$

D. $(f \circ g)(-1) \in [-5, 3]$

E. It is not possible to compose the two functions.

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10. Determine whether the function below is 1-1.

$$f(x) = 15x^2 - 56x - 396$$

A. No, because there is a y-value that goes to 2 different x-values.

B. No, because the range of the function is not $(-\infty, \infty)$.

C. No, because there is an x-value that goes to 2 different y-values.

D. No, because the domain of the function is not $(-\infty, \infty)$.

E. Yes, the function is 1-1.
